III.15 MINERAL RESOURCES

This chapter provides a brief history of federal mineral resource development and explains how regulations governing that development impact the Desert Renewable Energy Conservation Plan (DRECP) Bureau of Land Management (BLM) Land Use Plan Amendment (LUPA). Minerals in the LUPA Decision Area include geothermal resources, high-value resource mining such as gold and rare earth minerals, aggregate, sand and gravel, and oil and gas.

III.15.1 Statutory, Regulatory, and Policy Setting

Minerals management on public lands falls into three categories: locatable, leasable, and mineral materials (previously salable minerals). Federal laws, regulations, and guidance for mineral resources and mining are explained in the following paragraphs.

III.15.1.1 General Mining Law of 1872 (30 United States Code [U.S.C.] 21 et seq.)

The General Mining Law, as amended, grants citizens (and those seeking citizenship) of the United States the right to enter public lands and reserve interests for the exploration and development of minerals, subject to this mining law. The law specifically includes minerals such as gold, silver, copper, lead, zinc, and uranium; nonmetallic minerals such as asbestos, barite, gypsum, and mica; and uncommon varieties of stone (43 Code of Federal Regulations [CFR] 3800).

This law sets forth rules and procedures for the exploration, location, and patenting of lode, placer, and mill site mining claims. Claimants must file notice of the original claim with the BLM, as well as either an annual notice of the intention to hold, an affidavit of assessment work, or a similar notice.

III.15.1.2 Stock Raising Homestead Act of 1916 (43 U.S.C. 291-299)

Patents issued under the Stock Raising Homestead Act reserved minerals to the United States and granted the right to prospect, mine, and remove specified minerals. Certain conditions exist to protect the patent applicant's improvements.

III.15.1.3 Mineral Leasing Act of 1920 (30 U.S.C. 181 et seq.)

The Mineral Leasing Act authorizes and governs the leasing of public lands to develop deposits of coal, oil, gas, and other hydrocarbons, sulfur, phosphate, potassium, and sodium. The BLM issues right-of-way grants for oil and natural gas gathering, distribution pipelines, and related facilities, as well as oil and natural gas transmission pipelines and related facilities (43 CFR Part 2880, and Subchapter C).

III.15.1.4 Materials Sales Act of 1947 (30 U.S.C. 601–604)

The Materials Sales Act provides for materials disposal on public lands. The Secretary of the Department of the Interior (DOI) is authorized to develop and implement rules and regulations to dispose of mineral materials (including, but not limited to, common varieties of sand, stone, gravel, pumice, pumicite, cinders, and clay) and vegetative materials (including, but not limited to, yucca, manzanita, mesquite, cactus, and timber or other forest products) on public lands in the United States. These materials can be disposed of upon adequate payment to the DOI. The Secretary of the Interior has the authority and discretion to permit any federal, state, or territorial agency, unit, or subdivision, including municipalities, or any other association or corporation not organized for profit, to take and remove, without charge, materials and resources for uses other than commercial or industrial purposes or resale (43 CFR 3600).

III.15.1.5 Mineral Leasing Act for Acquired Lands of 1947 (30 U.S.C. 351 et seq.)

The Mineral Leasing Act for Acquired Lands broadens provisions of the Mineral Leasing Act and the authority of the Secretary of the Interior to include oil and gas operations on federal lands.

III.15.1.6 Geothermal Steam Act of 1970 (30 U.S.C. 1001 et seq.), and Amendments

The Geothermal Steam Act authorizes and governs the lease and development of geothermal steam and related resources on either certain federally managed lands or on lands where a geothermal resource was reserved to the United States (43 CFR 3200).

III.15.1.7 Mining and Mineral Policy Act of 1970 (30 U.S.C. 21[a])

The Mining and Mineral Policy Act fosters and encourages the private development of economically sound and stable domestic mining and mineral, metal, and mineral reclamation industries. The law also fosters the orderly and economic development of domestic mineral resources, reserves, and the reclamation of metals and minerals to satisfy industrial, security, environmental, mining, mineral, and metallurgical research, including the use and recycling of scrap to promote the efficient use of natural and reclaimable mineral resources. The law further promotes the study and development of methods for the disposal, control, and reclamation of mineral waste products, as well as the reclamation of mined lands to lessen the environmental impacts of mining's many aspects and activities.

III.15.1.8 Surface Mining Control and Reclamation Act of 1977 (30 U.S.C. 1201 et seq.)

The Surface Mining Control and Reclamation Act establishes a program for the regulation of surface mining activities under the administration of DOI's Office of Surface Mining, Reclamation, and Enforcement.

The law sets forth minimum uniform requirements for all mining on federal lands, including both the exploration for resources and the reclamation of mined lands to mitigate the many aboveground effects from mining. Mine operators are required to minimize disturbances and adverse impacts on fish, wildlife, and other elements of the natural environment and to enhance these resources where practical. Restoring land and water resources is a priority in the reclamation planning process.

III.15.1.9 Bureau of Land Management Manual 3031—Energy and Mineral Resource Assessment

The BLM's classification system determines the potential, or likelihood, of accumulated mineral resources in a given area. The *BLM Manual 3031—Energy and Mineral Resource Assessment* outlines BLM's mineral potential classification system, which includes the following levels:

- **Zero:** The geologic environment, the inferred geologic processes, and the lack of mineral occurrences do not indicate potential for accumulation of mineral resources.
- **Low:** The geologic environment and the inferred geologic processes indicate a low potential for accumulation of mineral resources. BLM no longer evaluates low-level potential.
- **Moderate:** The geologic environment, the inferred geologic processes, and the reported mineral occurrences or valid geochemical/geophysical anomalies indicate moderate potential for accumulation of mineral resources.
- **High:** The geologic environment, the inferred geologic processes, the reported mineral occurrences and/or valid geochemical/geophysical anomalies, and the known mines or deposits indicate high potential for accumulation of mineral resources. The "known mines and deposits" do not have to be within the area classified, but have to be within the same type of geologic environment.
- **Not Determined:** Mineral potential is not determined because of a lack of useful data. This notation does not require a level-of-certainty qualifier. This level is seldom used; when used, it is for a specific commodity only.

Levels of certainty are described below:

- 1. The available data are insufficient and/or cannot be considered as direct or indirect evidence to support or refute the possible existence of mineral resources within the respective area.
- 2. The available data provide indirect evidence to support or refute the possible existence of mineral resources.
- 3. The available data provide direct evidence, but are quantitatively minimal to support or refute the possible existence of mineral resources.
- 4. The available data provide abundant direct and indirect evidence to support or refute the possible existence of mineral resources.

III.15.1.10 Bureau of Land Management Minerals Guidance

Surface management under 43 CFR Subpart 3809 has two primary purposes:

- a. Prevent unnecessary or undue degradation of public lands by operations authorized by the mining laws. Anyone intending to develop mineral resources on public lands must prevent unnecessary or undue degradation of the land and reclaim disturbed areas. This subpart establishes procedures and standards to ensure that operators and mining claimants meet this responsibility.
- b. Provide for maximum possible coordination with appropriate state agencies to avoid duplication and ensure that operators prevent unnecessary or undue degradation of public lands.

Under subsection 3809.10, BLM also classifies mining operation use:

- Casual use: For which an operator does not need to notify BLM. The operator must reclaim any casual use disturbance. If operations do not qualify as casual use, an operator must submit a notice or plan of operations.
- Notice-level operations: For which operators conducting mineral exploration activities disturbing less than 5 acres and/or excavating less than 1,000 tons of material must submit a notice (except for certain suction dredging operations covered by subsection 3809.31[b]).
- Plan-level operations: For which an operator conducting mining operations, large exploration operations or mining related activities within certain special-status lands must both submit a plan of operations and obtain BLM approval.

The BLM categorizes minerals as locatable, leasable, or mineral materials. Each classification is administered differently, each category having unique regulatory requirements for administration for acquisition, exploration, and development. Definitions for locatable, leasable, and mineral materials appear below:

Locatable Minerals. Locatable minerals include metallic minerals such as gold, silver, copper, lead, zinc, and uranium; nonmetallic minerals such as alunite, asbestos, barite, bentonite, gypsum, geodes/gem minerals, mica, and zeolite mica; and uncommon varieties of stone (43 CFR 3800). The BLM policy and guidance for locatable minerals includes *BLM Manual 3800—Mining Claims Under the General Mining Laws* and *BLM Handbook H-3042-1—Solid Minerals Reclamation Handbook*.

Section 302 of the Federal Land Policy and Management Act of 1976 recognizes the rights of locators to claims filed under the Mining Law of 1872, including the right of ingress and egress. This section also requires the Secretary of the Interior to take any action, through regulation or otherwise, to prevent unnecessary or undue degradation of public lands (43 U.S.C. 1732). The regulations contained in 43 CFR 3715, 43 CFR 3802, and 43 CFR 3809 balance these two mandates by requiring management of the surface disturbances caused by mineral exploration development and reclamation, including mining claim use and occupancy. Appropriation of a mineral deposit is made by the location of a mining claim. A mining claimant's rights under the mining laws are subject to, and validated by, a discovery of a valuable mineral deposit that has been made within the boundaries of the mining claim.

Exploration and development must both obey all applicable federal and state laws, regulations, and policies and be conducted within applicable approved land use plans. Restrictions and stipulations may apply to a proposed activity, based on review and analysis by the authorized officer.

Leasable Minerals. These minerals include fluid minerals such as oil, gas, coalbed methane, carbon dioxide, and geothermal resources, as well as solid minerals such as coal, sodium, and potash. Although not a leasable mineral, helium is included in this category because it is typically associated with carbon dioxide exploration and development (43 CFR 3100 and 43 CFR 3200). The BLM policy and guidance for leasable minerals includes *BLM Manual Series 3100 Onshore Oil and Gas Leasing* and all associated handbooks, instruction memoranda, and orders.

Geothermal resources are renewable energy fluid minerals. The required BLM lease to develop them grants the right to access and develop within lease area boundaries and in accordance with the lease terms and applicable federal, state, and local laws, regulations, and ordinances. The lease also requires, unless otherwise stipulated, the commitment to allow surface land

use under standard terms and conditions. In assessing lease restrictions, BLM mandates the least restrictive available constraint in meeting resource protection objectives.

For split estate minerals (where the United States owns the minerals but not the land surface), leasing is authorized in accordance with federal law, regulations, and policy guidance. Land surface owners are notified of applications and given the opportunity to comment before leases are issued.

Mineral Materials. Mineral materials include construction materials such as sand, gravel, cinders, decorative rock, and building stone (43 CFR 3600). The BLM policy and guidance for mineral materials includes *BLM Handbook H-3242-1*, *Solid Minerals Reclamation Handbook* and *BLM Manual and Handbook 3600*.

Removal of mineral materials from BLM-administered lands requires either a sales contract or a free use permit. Disposal of mineral materials is discretionary and authorized in accordance with an approved land use plan and appropriate laws, regulations, and ordinances. The BLM's policy is to make mineral materials available to the public and local governmental agencies whenever possible and wherever environmentally acceptable. Mineral materials may not be developed on public lands if the development is not in the public interest or would unnecessarily degrade public lands or resources.

III.15.1.11 Memorandum of Understanding Between the Department of the Interior (Bureau of Land Management), Department of Agriculture (U.S. Forest Service), and the State of California Department of Conservation and State Mining and Geology Board

The purpose of the Memorandum of Understanding of 1992 (MOU) is to coordinate surface mining and reclamation in accordance with California's Surface Mining and Reclamation Act of 1975, as amended. The MOU ensures (1) the application of adequate and appropriate reclamation throughout the State of California, (2) simplification of the administration of surface mining and reclamation practice requirements on federal lands and on combined federal and private lands, (3) coordination of activities governing reclamation, and (4) elimination of duplication among lead agencies and counties (as defined in the Surface Mining and Reclamation Act, Public Resources Code Section 2728) when implementing state and federal requirements. The MOU acknowledges that the federal government recognizes that the Surface Mining and Reclamation Act applies to public lands in California and that counties act as the "lead agencies" responsible for regulating and protecting mineral resources classified by the State Geologist and the State Mining and Geology Board.

III.15.1.12 Energy Policy Act of 2005

The 2005 Energy Policy Act regulates and promotes traditional energy production as well as newer, more efficient energy technologies and conservation. It contains several provisions to make geothermal energy production on public lands more competitive with other types of energy generation.

III.15.2 Mineral Resources Within the Land Use Plan Amendment Decision Area

III.15.2.1 Geothermal Resources

Geothermal energy is natural heat from the interior of the earth. Sources of geothermal energy include artesian hot springs and wells that tap groundwater or dry rock at elevated temperatures from high-flow gradients in the subsurface. Geothermal resources are classified according to temperature. High-temperature resources are above 302°F (150°C). Moderate-temperature resources are between 194°F and 302°F (90°C and 150°C). Low-temperature resources are below 194°F (90°C). Only resources with temperatures high enough to produce steam have been developed commercially for power generation. Low-and moderate-temperature geothermal water can be used for ground-source heat pumps for applications such as heating buildings, and in industrial processes, greenhouses, aquaculture, and resorts.

Known geothermal resource areas (KGRAs) are areas where knowledge of the geology and supporting information suggest that a geothermal resource exists and warrants additional investment for leasing and exploration. KGRAs in the LUPA Decision Area are shown in Figure III.15-1. The Coso Hot Springs KGRA is in the Owens River Valley ecoregion subarea, in the area managed by the Ridgecrest Field Office. The Randsburg KGRA is in the Mojave and Silurian Valley and West Mojave and Eastern Slopes ecoregion subareas. The majority of KGRAs are in the Imperial Borrego Valley ecoregion subarea, managed by the El Centro field office. Table III.15-1 shows KGRAs, geothermal resource areas, and geothermal lease area acres in the LUPA Decision Area.

Table III.15-1 Known Geothermal Resource Area and Lease Area Acres on BLM-Managed Lands in the LUPA Decision Area

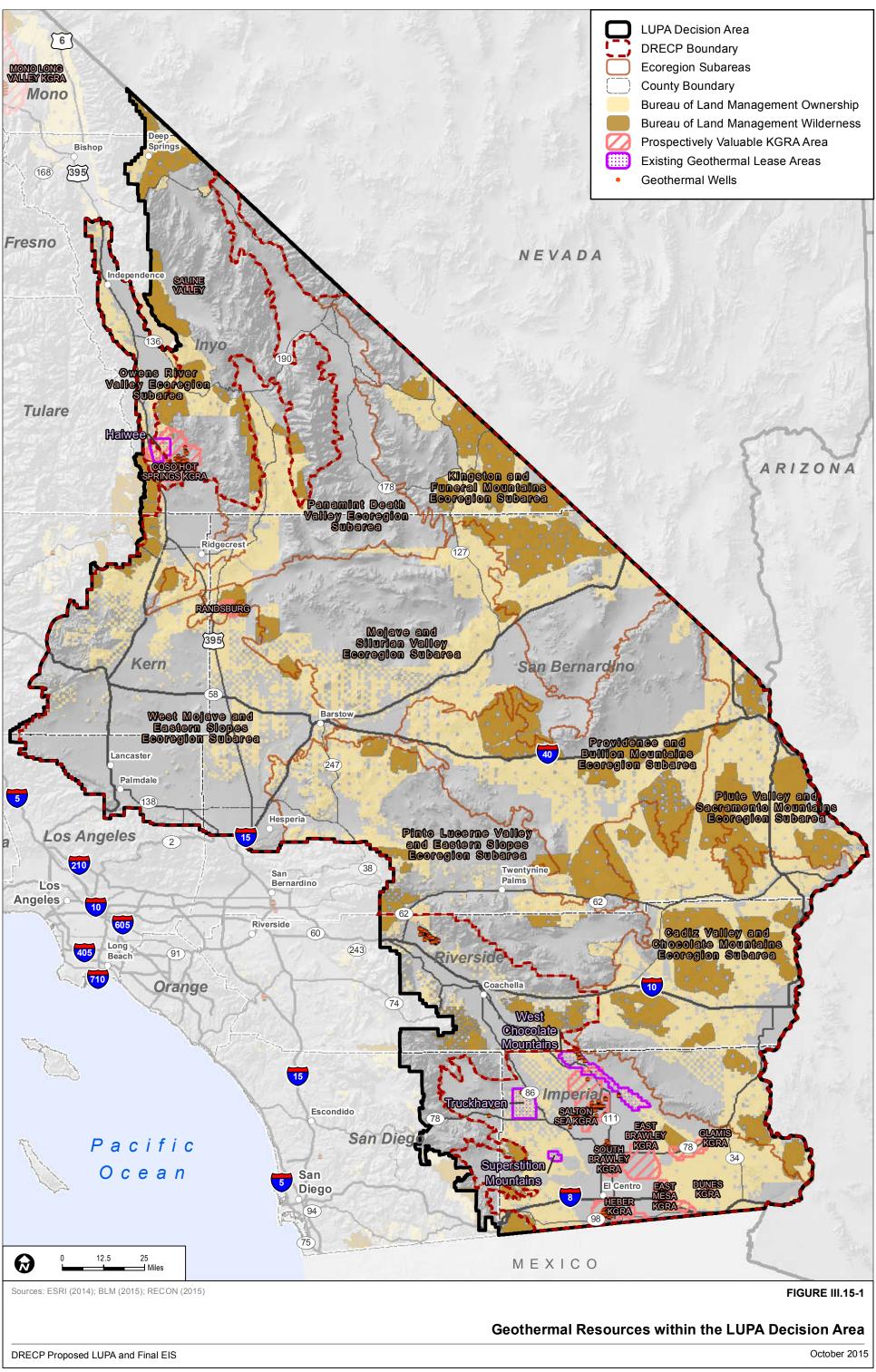
KGRA / Lease Area	Acres		
Imperial Borrego Valley			
Superstition Mountains Geothermal Lease Resource Area	3,000		
Truckhaven Geothermal Lease Area	15,000		
West Chocolate Mountains Geothermal Lease Resource Area	22,000		

Table III.15-1 Known Geothermal Resource Area and Lease Area Acres on BLM-Managed Lands in the LUPA Decision Area

KGRA / Lease Area	Acres			
Dunes KGRA	6,500			
East Brawley KGRA	30,000			
Glamis KGRA	24,500			
Salton Sea KGRA	12,000			
Mojave and Silurian Valley				
Randsburg KGRA 7,000				
Owens River Valley				
Haiwee Geothermal Lease Area 9,000				
Coso Hot Springs KGRA 10,500				
West Mojave and Eastern Slopes				
Randsburg Geothermal Area 4,500				
California Desert Conservation Area outside the DRECP boundary				
Haiwee Geothermal Lease Area 12,000				
Coso Hot Springs KGRA	23,500			
Total	179,500			

Notes: Several geothermal leases in the Truckhaven area were cancelled in late 2013. Acres may not reflect all cancelled leases. The following general rounding rules were applied to calculated values: values greater than 1,000 were rounded to the nearest 1,000; values less than 1,000 and greater than 100 were rounded to the nearest 100; values of 100 or less were rounded to the nearest 10, and therefore totals may not sum due to rounding. In cases where subtotals are provided, the subtotals and the totals are individually rounded. The totals are not a sum of the rounded subtotals; therefore, the subtotals may not sum to the total in the table.

Source: BLM 2015



Existing geothermal plants in the KGRAs and surrounding areas appear in Table III.15-2.

Table III.15-2 Geothermal Plants Within the LUPA Decision Area

Geothermal Plants	Megawatt (MW) Production
Coso Hot Springs KGRA – 4 generating plants (on the Naval Air Weapons Station China Lake)	270 MW
Salton Sea KGRA – 10 generating plants (CE Turbo, Elmore, Leathers, Vulcan, Del Ranch, and Salton Sea 1-5)	327 MW
2 plants under development (Hudson Ranch II and ORNI 18)	100 MW
South Brawley KGRA – 1 generating plant (Mesquite)	50 MW
North Brawley – 1 generating plant (North Brawley)	30 MW
Heber KGRA – 3 generating plants (Heber 1 and 2, Heber South)	100 MW
Niland – 2 generating plants (Niland and Hudson Ranch I)	100 MW
East Mesa KGRA – 6 generating plants (GEM Resources II, GEM Resources III, Ormesa I, Ormesa IE, Ormesa IH, and Ormesa II)	75 MW

Notes: The following general rounding rules were applied to calculated values: values greater than 1,000 were rounded to the nearest 1,000; values less than 1,000 and greater than 100 were rounded to the nearest 100; values of 100 or less were rounded to the nearest 10, and therefore totals may not sum due to rounding. In cases where subtotals are provided, the subtotals and the totals are individually rounded. The totals are not a sum of the rounded subtotals; therefore, the subtotals may not sum to the total in the table.

Source: California Energy Commission 2013

Geothermal prospects in and surrounding the KGRAs and their likely capacities are listed in Table III.15-3 and shown on Figure III.15-1.

Table III.15-3
Geothermal Prospects Within the LUPA Decision Area

Geothermal Prospect Area	Prospect Likely Capacity
Coso Hot Springs	355 MW
Dunes	11 MW
East Brawley	129 MW
East Mesa	148 MW
Glamis	6 MW
Heber	142 MW
Mesquite/South Brawley	62 MW
Mount Signal	19 MW
Niland	76 MW
North Brawley	135 MW
Randsburg	48 MW

Table III.15-3
Geothermal Prospects Within the LUPA Decision Area

Geothermal Prospect Area	Prospect Likely Capacity
Salton Sea	1,750 MW
Superstition Mountain	10 MW
Truckhaven	25 MW
Westmorland	50 MW

Notes: The following general rounding rules were applied to calculated values: values greater than 1,000 were rounded to the nearest 1,000; values less than 1,000 and greater than 100 were rounded to the nearest 100; values of 100 or less were rounded to the nearest 10, and therefore totals may not sum due to rounding. In cases where subtotals are provided, the subtotals and the totals are individually rounded. The totals are not a sum of the rounded subtotals; therefore, the subtotals may not sum to the total in the table.

Source: California Energy Commission 2013

III.15.2.2 High-Potential Mineral Areas

High-potential mineral areas are lands with existing and/or historic mining activity and a reasonable probability of future mineral resource development. Within the LUPA Decision Area, specific geographic areas have been defined as areas with the potential for recoverable high-priority and high-potential mineral resources, including rare earth element areas, as identified in BLM's California Geology, Energy, and Mineral Resource Geographic Information System (GIS) Data (2013). The acreage of high-potential mineral development is shown in Table III.15-4. High-potential mineral areas are also shown for each ecoregion subarea and for the California Desert Conservation Area (CDCA) outside the DRECP boundary in Appendix R1 (Figure R1.15-1 through Figure R1.15-11).

Table III.15-4
Acres of High Potential Minerals Within the LUPA Decision Area

Areas With High Potential Minerals	Total Acres
Cadiz Valley and Chocolate Mountains	214,000
Imperial Borrego Valley	143,000
Kingston and Funeral Mountains	79,000
Mojave and Silurian Valley	77,000
Owens River Valley	400
Panamint Death Valley	41,000
Pinto Lucerne Valley and Eastern Slopes	52,000
Piute Valley and Sacramento Mountains	34,000
Providence and Bullion Mountains	146,000

Table III.15-4
Acres of High Potential Minerals Within the LUPA Decision Area

Areas With High Potential Minerals	Total Acres
West Mojave and Eastern Slopes	30,000
CDCA Area outside the DRECP boundary	176,000
Total	992,000

Notes: The following general rounding rules were applied to calculated values: values greater than 1,000 were rounded to the nearest 1,000; values less than 1,000 and greater than 100 were rounded to the nearest 100; values of 100 or less were rounded to the nearest 10, and therefore totals may not sum due to rounding. In cases where subtotals are provided, the subtotals and the totals are individually rounded. The totals are not a sum of the rounded subtotals; therefore, the subtotals may not sum to the total in the table.

Source: BLM California Geology, Energy, Mineral Resource GIS Data 2013

III.15.2.3 High-Priority Mineral and Energy Locations

LUPA Decision Area lands also have existing high-priority mineral or energy locations. These areas are shown in Table III.15-5 and in Figure III.15-2 (also see Figure R1.15-1 through Figure R1.15-11a and R1.15-11b in Appendix R1, which identify mineral resources in ecoregion subareas and the CDCA Area outside the DRECP boundary).

Table III.15-5
Existing High-Priority Mineral or Energy Locations Within the LUPA Decision Area

Mineral or Energy Site	Acres
Cadiz Valley and Chocolate Mountains	2,600
Cadiz Evaporites	
Imperial Borrego Valley	9,000
Mesquite Gold Mine – including 650 acres of State Land lease	
Kingston and Funeral Mountains	10,500
Molycorp Rare Earth Element (Mountain Pass Deposit/Mine)	
Owens River Valley	15,700
U.S. Borax Trona Mine – State Land lease	
Panamint Death Valley	75,000
Briggs Mine (Etna)	
Searles Dry Lake Evaporites	
Providence and Bullion Mountains	21,000
Bristol Dry Lake Evaporites	
Hector Clay Mine	
Castle Mountains Mine	
CDCA Area outside the DRECP boundary	2,000
Total	135,800

Notes: The following general rounding rules were applied to calculated values: values greater than 1,000 were rounded to the nearest 1,000; values less than 1,000 and greater than 100 were rounded to the nearest 100; values of 100 or less were rounded to the nearest 10, and therefore totals may not sum due to rounding. In cases where subtotals are provided, the subtotals and the totals are individually rounded. The totals are not a sum of the rounded subtotals; therefore, the subtotals may not sum to the total in the table.

Source: BLM California Geology, Energy, Mineral Resource GIS Data 2013

III.15.2.4 Rare Earth Element Areas

Rare earth elements are the 15 elements with atomic numbers 57 through 71, from lanthanum to lutetium ("lanthanides"), plus yttrium (39), which is chemically similar to the lanthanide elements and is therefore typically included with the other rare earth elements. Industrial demand for these elements is relatively small in terms of tons extracted; these elements are essential, however, for a diverse and expanding array of high-technology applications. Rare earth elements containing magnets, metal alloys for batteries and light-weight structures, as well as phosphors are essential for many current and emerging alternative energy technologies including electric vehicles, energy-efficient lighting, and wind power. Rare earth elements are also critical for a number of key defense systems and other advanced applications (Long et al. 2010).

The Mountain Pass Deposit and Mine and Music Valley areas are two high-profile rare earth element sites in the LUPA Decision Area:

- The Mountain Pass Deposit and Mine is in the northeastern corner of San Bernardino County. The Mountain Pass igneous complex contains a carbonatite body, called the Sulphide Queen, which comprises the bulk of the rare element resources in the area. The Sulphide Queen is the largest known mass of high-grade rare earth element ore in the United States. Molycorp actively mined the Mountain Pass Deposit and Mine through 2002, when its permit expired (Long et al. 2010). Molycorp began construction in 2011 to expand and modernize the Mountain Pass Mine facility, also known as Project Phoenix. Active mining of earth elements has recommenced at the facility (Molycorp 2014).
- The **Music Valley** area consists of xenotime deposits, of probable Precambrian age, within the Pinto Gneiss. The Music Valley area is a reported deposit with no current exploration activity. Small-scale exploration of these deposits was conducted during the 1950s to determine levels of radioactivity (Long et al. 2010). The California State Lands Commission issued a mineral prospecting permit (CSLC Lease No. PRC 9138.2) to Green Materials International, LLC effective July 1, 2014 to explore for rare earth elements on a State school land section in Music Valley. The California Division of Mines and Geology studied the Music Valley area; results were published in 1964. Evans found that the Music Valley area contained U-Thor deposit, which was intruded by Palms Granite and Gold Park Gabbro-Diorite and was considered to be of the Precambrian age (Evans 1964). The University of California, Santa Barbara is currently studying the rare earth element origin in metamorphic rocks of Music Valley.

Rare earth element areas within the LUPA Decision Area are presented in Table III.15-6 by ecoregion subarea and CDCA Area outside the DRECP boundary, and illustrated in Figure III.15-3.

Table III.15-6
Rare Earth Element Acres Within the LUPA Decision Area

Rare Earth Element Areas	Total Acres	
Cadiz Valley and Chocolate Mountains	2,000	
Kingston and Funeral Mountains	25,000	
Panamint Death Valley	2,000	
Pinto Lucerne Valley and Eastern Slopes	12,000	
CDCA Area outside the DRECP boundary	19,000	
Total	60,000	

Notes: The following general rounding rules were applied to calculated values: values greater than 1,000 were rounded to the nearest 1,000; values less than 1,000 and greater than 100 were rounded to the nearest 100; values of 100 or less were rounded to the nearest 10, and therefore totals may not sum due to rounding. In cases where subtotals are provided, the subtotals and the totals are individually rounded. The totals are not a sum of the rounded subtotals; therefore, the subtotals may not sum to the total in the table.

Source: BLM 2013

III.15.2.5 Locatable, Leasable, and Mineral Materials

A detailed description of locatable, leasable, and mineral materials is presented in Section III.15.1.1. Locatable, leasable (including geothermal), and mineral material areas found within the LUPA Decision Area are presented in Table III.15-7 and in Figure III.15-4.

Table III.15-7
Locatable, Leasable, and Mineral Material Acres Within the LUPA Decision Area

			Mineral	
Development	Locatable Acres	Leasable Acres	Material Acres	
Cadiz Valley (and Chocolate Mount	ains		
Existing Development	48,000	39,000	100	
Foreseeable Development	36,000		6,000	
Imper	rial Borrego Valley			
Existing Development	47,000		20,000	
Foreseeable Development			16,000	
Kingston o	and Funeral Mountain	S		
Existing Development	63,000		4,000	
Foreseeable Development	56,000		5,000	
Mojave	Mojave and Silurian Valley			
Existing Development	9,000		<100	
Foreseeable Development	300		200	
Owens River Valley				
Existing Development			2,000	
Foreseeable Development	3,000			

Table III.15-7
Locatable, Leasable, and Mineral Material Acres Within the LUPA Decision Area

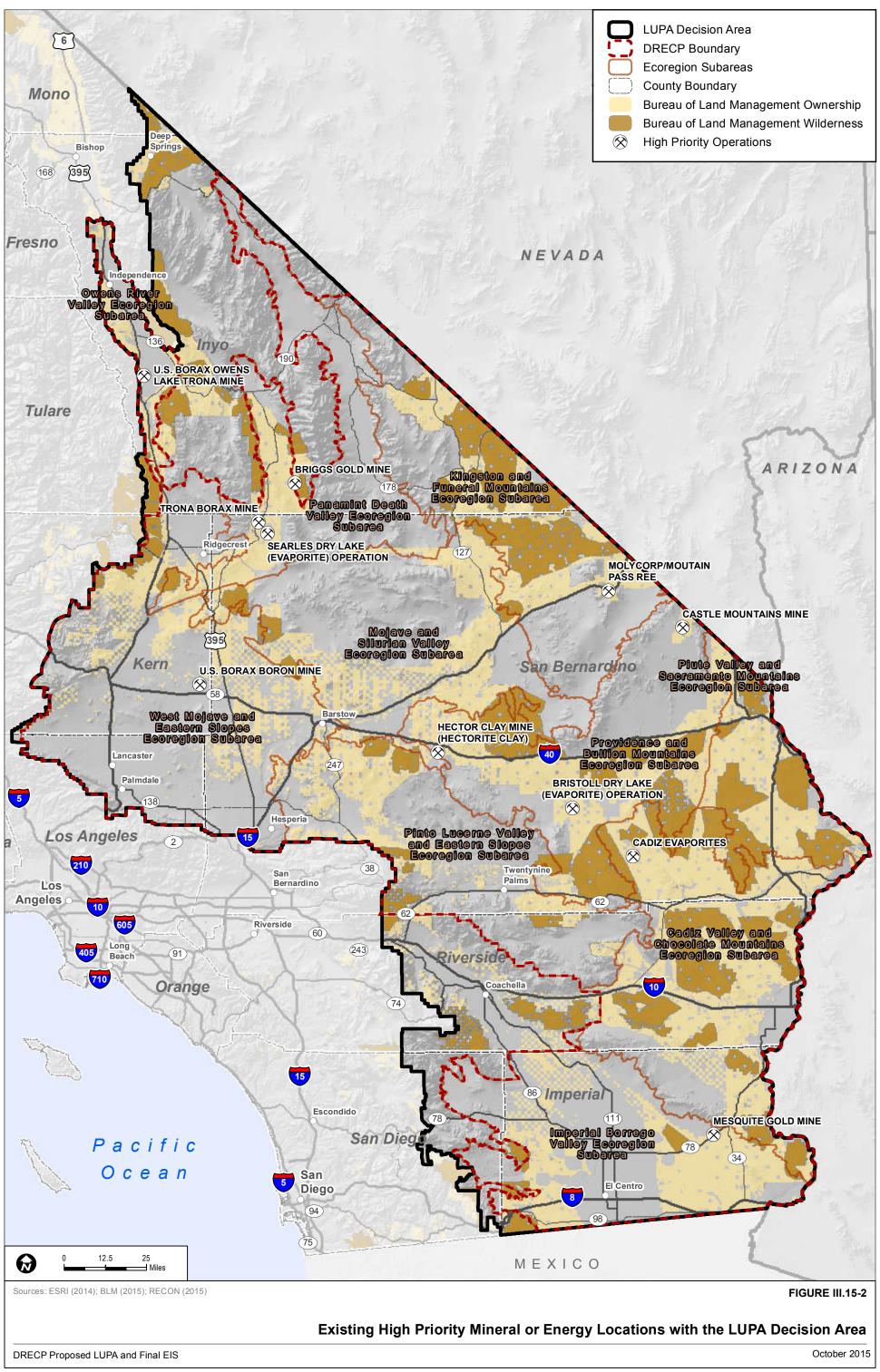
Development	Locatable Acres	Leasable Acres	Mineral Material Acres	
Panai	mint Death Valley			
Existing Development	g Development 6,000 3			
Foreseeable Development	500			
Pinto Lucerne	Valley and Eastern SI	opes		
Existing Development	3,000			
Foreseeable Development				
Piute Valley ar	nd Sacramento Moun	tains		
Existing Development	58,000		700	
Foreseeable Development	73,000		43,000	
Providence	and Bullion Mountai	ns		
Existing Development	60,000	32,000	400	
Foreseeable Development	67,000		8,000	
West Mojave and Eastern Slopes				
Existing Development	5,000		4,000	
Foreseeable Development	300			
CDCA Area outside the DRECP boundary	7,000		6,000	
Total	542,100	71,000	118,400	

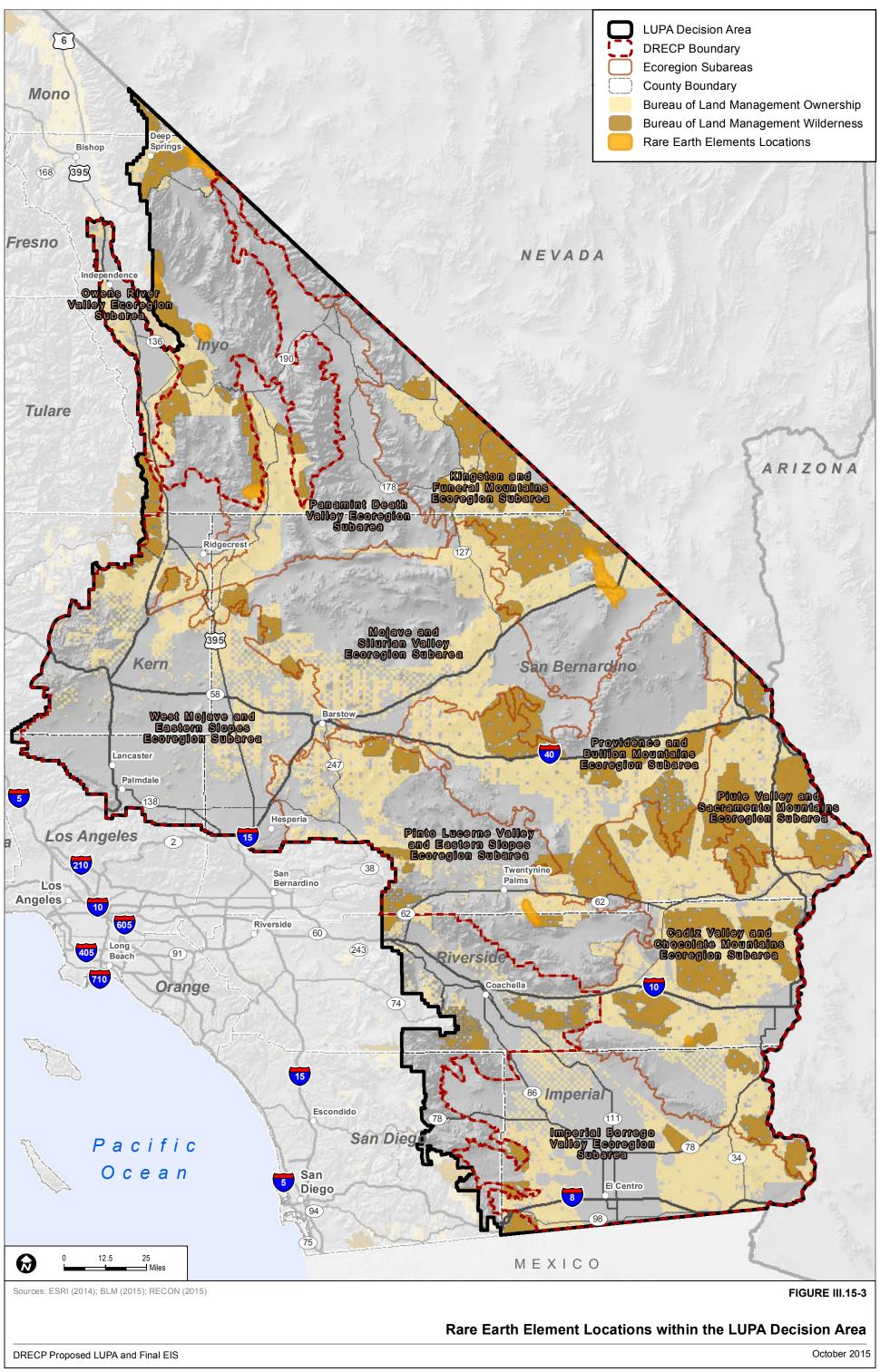
Notes: The following general rounding rules were applied to calculated values: values greater than 1,000 were rounded to the nearest 1,000; values less than 1,000 and greater than 100 were rounded to the nearest 100; values of 100 or less were rounded to the nearest 10, and therefore totals may not sum due to rounding. In cases where subtotals are provided, the subtotals and the totals are individually rounded. The totals are not a sum of the rounded subtotals; therefore, the subtotals may not sum to the total in the table.

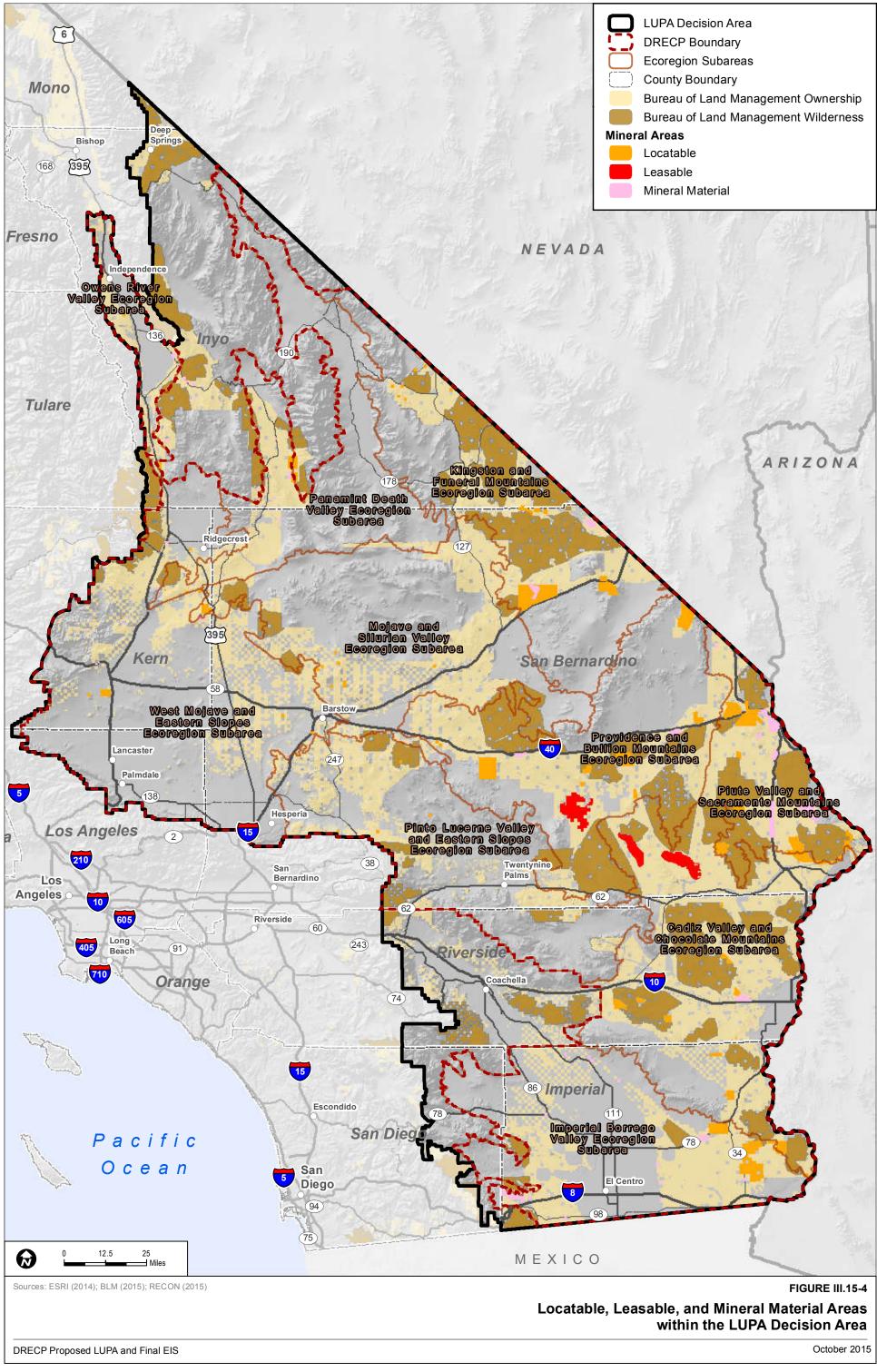
Source: BLM 2013

III.15.2.6 Oil and Gas Resources

Based on review of mining data and BLM information, there are no oil and gas resources within the LUPA Decision Area.







III.15.3 Transmission Outside the DRECP Area

Required transmission facilities outside the DRECP area generally fall into four geographic areas: San Diego, Los Angeles, North Palm Springs–Riverside, and Central Valley. Information gathered from four large transmission projects in these areas forms the basis of the following discussion on mineral resources and transmission. This section describes the mineral and oil resources in these areas, including a specific listing of resources within 1,000 feet of either side of the project routes analyzed. The descriptions and analyses in this section are based on:

- Maps and data from the California Department of Conservation, Division of Oil, Gas, and Geothermal Resources.
- The U.S. Geological Survey Mineral Resources Data System.
- The BLM's Legacy Rehost System (LR2000), Land and Mineral Reports.
- Aerial imagery from the California Geological Survey, previously known as the California Division of Mines and Geology.

Table III.15-8 presents an overview of the types and numbers of mineral resources along the transmission corridors outside the DRECP area.

Table III.15-8
Mineral Resources Outside the DRECP Area

Corridor	Regional Mineral Resources	Number of Mineral Resources Along Corridor	Regional Oil Resources	Oil Fields Along Corridor
San Diego	Sand, gravel, gold, phosphorous, tungsten, crushed stone	14	3 wildcat oil wells	None
Los Angeles	Sand, gravel, rock products, clay, gold, copper, tungsten	10	30 active oil and/or gas fields in operation and many small abandoned oil/gas fields in the LA area	1 – Montebello
North Palm Springs– Riverside	Sand, gravel, gold	4	None	None

Table III.15-8
Mineral Resources Outside the DRECP Area

Corridor	Regional Mineral Resources	Number of Mineral Resources Along Corridor	Regional Oil Resources	Oil Fields Along Corridor
Central	Sand, gravel	2	Coalinga, Coalinga East	4 – Coalinga,
Valley		(plus 6 small	Extension, Jacalitos,	Coalinga East,
		gravel	Guijarral Hills, Pleasant	Guijarral Hills,
		operations)	Valley, Kettleman Hills,	Pleasant
			Pyramid Hills	Valley

Sources: California Public Utilities Commission (CPUC) and BLM 2008; CPUC and U.S. Forest Service 2010; CPUC 2001; CPUC and BLM 2006

III.15.3.1 San Diego Area

This transmission corridor extends from Ocotillo, in southwestern Imperial County, to San Diego, and roughly follows the existing Sunrise Powerlink corridor westward.

Metallic and nonmetallic mineral deposits are in both San Diego and Imperial counties. The principal minerals in San Diego County are sand, gravel, and crushed and broken stone. Lesser mineral commodities also produced in San Diego County include dimension stone, clay, gem, and other minerals and salts. Imperial County produces a variety of mineral commodities, including gypsum, gravel, gold, manganese, pumice, and crushed stone. There are varying amounts of metallic mineral deposits in both counties, primarily in mountainous bedrock areas. Gold, copper, and tungsten are primary metallic minerals (ores) mined in these counties.

Records for mining claims on BLM land were reviewed using land and mineral reports in BLM's Legacy Rehost System (LR2000). No mining claims were found in the San Diego-area corridor. GIS data from the U.S. Geological Survey Mineral Resources Data System (MRDS) for Imperial and San Diego counties were reviewed, and mining potential was identified along the Sunrise Powerlink transmission route. These locations were further confirmed and verified through aerial photos.

Fourteen sites on private lands with either mineral occurrences or past or current mining activities were identified in the San Diego area transmission corridor: two sand and gravel quarries; seven gold mines (three producers and four prospects); one occurrence of gold, phosphorous, and tungsten; one past producer of tungsten; and one crushed stone producer. California Department of Conservation, Division of Oil, Gas, and Geothermal Resources (DOGGR) online maps indicate no oil or gas fields in the San Diego area. The San Diego County map shows three drilled wildcat oil wells in the Ocotillo Wells area north of

Highway 78 and the Ocotillo Wells Airport. Online DOGGR maps show several geothermal fields in Imperial County near the San Diego area (CPUC and BLM 2008).

III.15.3.2 Los Angeles Area

Transmission corridors extend from Palmdale to the Los Angeles Basin, roughly following segments 6, 7, and 11 of the Tehachapi Renewable Transmission Project.

There are metallic and nonmetallic mineral deposits in the Los Angeles area. Metallic mineral deposits are primarily in mountainous areas of exposed igneous and metamorphic bedrock. Nonmetallic mineral resources including sand, clay, gravel, rock products, and petroleum are important state mineral resources actively mined in the Los Angeles area.

Both metallic and nonmetallic mineral resources lie in and around the Los Angeles area. Mineral resources in nearby Kern County include limestone and dolomite deposits, which are used to make cement. In Los Angeles County the principal mineral commodities are sand, gravel, and crushed and broken stone. Metallic mineral deposits are in both counties, primarily in mountainous bedrock areas, though there are no active metallic mines in or around the DRECP area.

Ten sites with either minerals or past or current mining activities lie along the Tehachapi Renewable Transmission Project corridor. These sites include three metallic mineral (ore) mines, one mapped ore site, two ore prospects, three sand and gravel quarries, and one crushed/broken stone quarry. Eight of the ten sites are inactive: one ore site, two ore prospects, three past ore (gold) producers, a past gravel quarry, and a past crushed/broken rock quarry. The quarries have been reclaimed and are occupied today by buildings and parking lots. None are listed as active mines by California Geological Survey. The two active sites are sand and gravel quarries in the Irwindale area, the Duarte and Irwindale Pits. The Irwindale Pit contains three adjacent pits (commonly known as Irwindale Pits #1, #2, and #3) owned by the United Rock Products Corporation; two are currently operational.

The Los Angeles Basin contains more than 30 operational oil and/or gas fields as well as many small abandoned oil/gas fields. DOGGR online maps show several active and abandoned oil or gas fields in the DRECP area vicinity, including the adjacent Montebello oil field (CPUC and U.S. Forest Service 2010).

III.15.3.3 North Palm Springs—Riverside Area

Both metallic and nonmetallic mineral deposits are in the North Palm Springs-Riverside area. Metallic mineral deposits are primarily in mountainous areas of exposed bedrock. There are no active metallic mineral mines in the vicinity. Sand, clay, gravel, and rock products are important mineral resources in California and still actively mined in the area.

The MRDS identified four mineral resource sites within the proposed Devers–Palo Verde No. 2 transmission right-of-way: two sand and gravel operations and one gold prospect in the Coachella Valley area, and one gold mine on the Palo Verde Mesa. Only the Indio Pit, a sand and gravel quarry in the Indio Hills area, is still operational (CPUC and BLM 2006).

III.15.3.4 Central Valley

The Central Valley transmission corridor extends from Rosamond in the North Mojave Desert to Tracy, roughly following the existing Path 15 and 26 corridors. Mineral resources in the Central Valley area, including petroleum, gypsum, and sand and gravel, have been mined at several locations. The region is also at the center of controversial recent proposals to extract oil from the underlying Monterey Shale Formation through hydraulic fracturing, known as fracking (Sommer 2012; Clean Water Action 2013).

III.15.3.4.1 Petroleum

There are oil and natural gas deposits in the southern part of the Central Valley area near Coalinga. Exploration for petroleum began in the 1890s near Oil City, about 10 miles north of Coalinga. Since that time, several major oil fields have been developed in the western hills of the Coast Ranges (CPUC 2001). In 2012, annual production in large fields in the area included Midway Sunset (29.3 million barrels), South Belridge (23.6 million barrels), Cymric (13.6 million barrels), Lost Hills (11.0 million barrels), and Coalinga (5.5 million barrels) (CEC 2012; DOGGR 2012).

Production in other oil fields in the vicinity included Jacalitos (139,000 barrels), Kettleman City (68 barrels), Pyramid Hills (58,000 barrels), Kettleman Middle Dome (58,000 barrels), Kettleman North Dome (26,000 barrels), and Coalinga East Extension (8,000 barrels) (DOGGR 2012).

While natural gas fields do not produce as much as oil fields, there are several active fields in the area. Natural gas withdrawals in 2012 totaled 2,969,299 cubic feet (Mcf) in DOGGR District 4 (Kern, Tulare, and Inyo counties) and 1,747,856 Mcf in District 5 (including Fresno, Stanislaus, Madera, Merced, San Benito counties, as well as other counties east to the Nevada border) (DOGGR 2012).

III.15.3.4.2 Sand and Gravel

Isolated, limited deposits of sand and gravel have been extracted at several small quarry operations in the Central Valley area. These operations are generally in the valleys draining the Diablo Range and are removing recent alluvial deposits from the valley floors. There are operations on Los Banos Creek, Little Panoche Creek, Panoche Creek, Cantua Creek, and at Los Gatos Creek north of the Coalinga Airport. A large pit operation is at the Folsom

gravel pit on Los Gatos Creek, one mile north of Coalinga. Most developed and potential sources of aggregate in the Central Valley area have difficulty meeting strict federal specifications for aggregate materials. That is why the Folsom deposits, which do meet the standards, have been extensively developed. Potential aggregate fill and select fine sands sources were previously identified for development in tandem with the Los Banos Grandes Reservoir project (CPUC 2001). A feasibility report was prepared in 1990, but the proposed project had not been constructed as of 2014.

III.15.3.4.3 Gypsum

Quaternary deposits of impure gypsum have been mined near Los Banos and at other isolated locations along the west side of the San Joaquin Valley. These materials are used in agriculture as fertilizers or soil amendments. No known commercially viable gypsum extraction areas are in the Central Valley area (CPUC 2001).